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REMARKS / ARGUMENTS

In the Advisory Action Paper No. 02070601, the Examiner remarks that for purposes of appeal, the proposed amendments of Applicant's February 1, 2006, Amendment will be entered, and that the pending claims 1-4, 6-22, 28-34, 37-48, 50, 51, 53 and 55, will stand rejected.

In view of Applicant's proposed amendments being acceptable for entry, Applicant's listing of claims presented herein are in reference to the claims as though Applicant's February 1, 2006, amendments were entered.

Status of Claims

Claims 1-4, 6-22, 28-34, 37-48, 50, 51, 53 and 55, are pending in the application and stand rejected. Applicant has amended Claims 1, 3, 28, 33, 34, 47, 53 and 55, and has added new Claims 58-60, leaving Claims 1-4, 6-22, 28-34, 37-48, 50, 51, 53, 55 and 58-60, for consideration upon entry of the present Amendment.

Applicant respectfully submits that the rejections under 35 U.S.C. §102(b) and 35 U.S.C. §103(a) have been traversed, that no new matter has been entered, and that the application is in condition for allowance.

Claim Rejections under 35 U.S.C. §102(b)

Of the pending claims, Claims 1, 6-8, 13-15, 17, 18, 34, 42, and 45 stand rejected under 35 U.S.C. 102(b) as being anticipated by Giger et al. (U.S. Patent No. 6,205,348, hereinafter Giger).

Applicants traverse these rejections for the following reasons.

Applicants respectfully submit that "[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, *in a single prior art reference.*" *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987) (emphasis added). Moreover, "[t]he identical invention must be shown in as complete detail as is contained in the *** claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). Furthermore, the single source must disclose all of the claimed elements "*arranged as in the claim.*" *Structural Rubber Prods. Co. v. Park Rubber Co.*, 749 F.2d 707, 716, 223 U.S.P.Q. 1264, 1271 (Fed. Cir.

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1984) (emphasis added). Missing elements may not be supplied by the knowledge of one skilled in the art or the disclosure of another reference. Titanium Metals Corp. v. Banner, 778 F.2d 775, 780, 227 U.S.P.Q. 773, 777 (Fed. Cir. 1985).

Applicant has amended independent Claims 1 and 34 to now recite, inter alia,

"A method for computer aided processing of dual or multiple energy images acquired using an X-ray source, the method comprising:

employing a data source, the data source including a dual or multiple energy image set including a high energy image, a low energy image, a bone image, and a soft tissue image, each member of the image set being available for processing along with each other member of the image set, each member of the image set being arranged at the data source in such a manner as to allow the computer aided processing to be performed once by incorporating features from all images of the image set;..." (Claim 1); and

"A method for detecting bone fractures, erosions, calcifications or metastases using an X-ray source, the method comprising:

employing a data source, the data source including a dual or multiple energy image set, the image set comprising a high energy image, a low energy image, a bone image, and a soft tissue image, each member of the image set being available for processing along with each other member of the image set, each member of the image set being arranged at the data source in such a manner as to allow processing of the image set to be performed once by incorporating features from all images of the image set;..." (Claim 34).

No new matter has been added as antecedent support may be found in the application as originally filed, such as at Paragraph [0051], and at Figures 6, 7, 12 and 15-19, for example.

Dependent claims inherit all of the limitations of the respective parent claim.

In Advisory Action Paper No. 02070601 (continuation sheet), the Examiner remarks that "The claim language does not disclose any specifics as to how the images are arranged within the image set."

In alleging anticipation, the Examiner references Giger at column 7 lines 47-51 in an effort to show that Giger discloses high energy images, low energy images, a bone image, and a soft tissue image. Final Action Paper No. 11282005, page 3.

In comparing Giger with the amended claims, Applicant respectfully submits that Giger does not disclose "each member of the image set being available for processing along with each

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other member of the image set, each member of the image set being arranged at the data source in such a manner as to allow processing of the image set to be performed once by incorporating features from all images of the image set", which is specifically claimed for in independent Claims 1 and 34.

In Giger, Applicant finds disclosure of an energy subtraction technique for producing bone-cancelled images and soft-tissue-cancelled images. Column 7, lines 43-51. However, once the high-energy and low-energy images of Giger have been used for the energy subtraction technique, Giger is absent any disclosure of those same images *being arranged at the data source in such a manner as to allow the computer aided processing to be performed once by incorporating features from all images of the image set*.

Contrary to the claimed invention, Applicant does not find Giger to disclose an *image set comprising a high energy image, a low energy image, a bone image, and a soft tissue image, each member of the image set being available for processing along with each other member of the image set, wherein each member of the image set is arranged at the data source in such a manner as to allow the computer aided processing to be performed once by incorporating features from all images of the image set*.

While Giger discloses certain elements of the claimed image set, there is no disclosure in Giger of each and every element of the *image set being available for processing along with each other element of the image set, wherein each member of the image set is arranged at the data source in such a manner as to allow the computer aided processing to be performed once by incorporating features from all images of the image set*, and therefore does not disclose each and every element of the claimed invention arranged as claimed.

Absent anticipatory disclosure in Giger of each and every element of the claimed invention arranged as claimed, Giger cannot be anticipatory.

Regarding Claim 8 More Specifically

Claim 8 recites, inter alia,

"...wherein the feature selection algorithm *sorts through features of the known samples, selects useful features of the known samples, and discards features of the known samples which do not provide useful information*."

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In alleging anticipation, the Examiner alleges that Giger discloses each and every element of the claimed invention by reference to Giger at col. 11, line 65 - col. 12, line 13. Final Action Paper No. 11282005, page 5.

In respectful disagreement with the Examiner, Applicant does not find Giger to disclose each and every element of Claim 8 arranged as claimed.

Contrary to the Examiner's allegation, Applicant finds Giger to disclose "a nonlinear logistic function" that provides iterative adjustment "so that the difference between the output values and the desired results is minimized." Col. 11, line 65 - col. 12, line 13.

In comparing Giger with the claimed invention, Applicant does not find Giger to disclose each and every element of the claimed invention arranged as claimed. More specifically, Applicant does not find Giger to disclose wherein the feature selection algorithm *sorts through features of the known samples, selects useful features of the known samples, and discards features of the known samples which do not provide useful information.*

Applicant finds Giger to disclose "minimizing", but does not find Giger to disclose "sorting", "selecting", and "discarding".

Absent anticipatory disclosure in Giger of each and every element of the claimed invention arranged as claimed, Giger cannot be anticipatory.

In view of the amendment and foregoing remarks, Applicant submits that Giger does not disclose each and every element of the claimed invention arranged as claimed and therefore cannot be anticipatory. Accordingly, Applicant respectfully submits that the Examiner's rejection under 35 U.S.C. §102(b) has been traversed, and requests that the Examiner reconsider and withdraw of this rejection.

Claim Rejections under 35 U.S.C. §103(a)

Group I: Of the pending claims, Claims 2-4, 16, 19, 20, 29-32, 53 and 55 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Giger.

Group II: Of the pending claims, Claims 9-12, 21, 22, 28, 33, 37-41, 43, 44, and 46 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Giger in view of Nishikawa et al. (U.S. Patent No. 6,058,322, hereinafter Nishikawa).

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Group III: Of the pending claims, Claims 47-48 and 50-51 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Nishikawa in view of Giger.

Applicant traverses these rejections for the following reasons.

Applicants respectfully submit that the obviousness rejection based on the References is improper as the References fail to teach or suggest *each and every element of the instant invention arranged to perform as the claimed invention performs*. For an obviousness rejection to be proper, the Examiner must meet the burden of establishing a prima facie case of obviousness. *In re Fine*, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988). The Examiner must meet the burden of establishing that all elements of the invention are taught or suggested in the prior art. MPEP §2143.03.

Group I:

Regarding Claims 2-4, 16, 19 and 20

Claims 2-4, 16, 19 and 20 depend directly from Claim 1, which has been amended as set forth above. In alleging obviousness, the Examiner applies Giger absent a second reference.

In view of the remarks set forth above regarding Claim 1, Applicant submits that Giger is deficient in its teaching of each and every element of Claim 1, and therefore cannot properly be applied to establish a prima facie case of obviousness against claims dependent from Claim 1.

Accordingly, Applicant submits that Claims 2-4, 16, 19 and 20 are directed to allowable subject matter, and respectfully requests notice of allowance thereof.

Regarding Claim 3 More Specifically

Claim 3 now recites, inter alia,

“...further comprising acquiring the image set using x-ray computed tomography (CT), wherein the dual or multiple energy CT acquisition enables computer aided discrimination between different tissue types of differing densities from different regions of an imaged object.”

In comparing Giger with the claimed invention, Applicant does not find Giger to teach or suggest the advantages of using dual or multiple energy CT to enable computer aided discrimination between different tissue types of differing densities from different regions of an imaged object. Absent such teaching or suggestion of the aforementioned advantages, one skilled in the art would not be motivated to do what Applicant has done. As such, a prima facie case of obviousness cannot be established.

Regarding Claims 29-32

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Claims 29-32 depend either directly or indirectly from Claim 28, which has been amended to recite limitations similar to those of amended Claim 1.

In view of the remarks set forth above regarding Claim 1, which Applicant submits are equally applicable to amended Claim 28, Applicant submits that Giger is deficient in its teaching of each and every element of Claim 28, and therefore cannot properly be applied to establish a prima facie case of obviousness against claims dependent from Claim 28.

Accordingly, Applicant submits that Claims 29-32 are directed to allowable subject matter, and respectfully requests notice of allowance thereof.

Regarding Claims 53 and 55

Claims 53 and 55 have been amended to recite limitations similar to those of Claim 1.

In view of the remarks set forth above regarding Claim 1, which Applicant submits are equally applicable to amended Claims 53 and 58, Applicant submits that Giger is deficient in its teaching of each and every element of Claims 53 and 58, and therefore cannot properly be applied to establish a prima facie case of obviousness against those claims.

Accordingly, Applicant submits that Claims 53 and 58 are directed to allowable subject matter, and respectfully requests notice of allowance thereof.

Additionally, amended Claim 53 recites, inter alia,

"...acquiring an image set of volumetric computed tomography images using cone-beam tomography..."

In comparing the teaching of Giger with the claimed invention, Applicant submits that Giger is deficient in its teaching of cone-beam tomography for the purpose of performing as the claimed invention performs. Absent such a teaching, Applicant respectfully submits that a prima facie case of obviousness cannot be established.

Group II:

Regarding Claims 9-12, 21 and 22

Claims 9-12, 21 and 22 depend either directly or indirectly from Claim 1, which has been amended as set forth above. Dependent claims inherit all of the limitations of the parent claim. In alleging obviousness, the Examiner applies Giger in combination with Nishikawa.

In view of the remarks set forth above, Applicant submits that Giger is deficient in its teaching of each and every element of Claim 1, and further submits that Nishikawa fails to cure this deficiency. More specifically, Applicant submits that the combination of Giger and

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Nishikawa fails to teach or suggest "each member of the image set being available for processing along with each other member of the image set, each member of the image set being arranged at the data source in such a manner as to allow the computer aided processing to be performed once by incorporating features from all images of the image set", and therefore cannot properly be applied to establish a prima facie case of obviousness against claims dependent from Claim 1.

Accordingly, Applicant submits that Claims 9-12, 21 and 22 are directed to allowable subject matter, and respectfully requests notice of allowance thereof.

Regarding Claim 28

Claim 28 has been amended to recite limitations similar to those of amended Claim 1.

In view of the remarks set forth above regarding Claim 1, which Applicant submits are equally applicable to amended Claim 28, Applicant submits that the combination of Giger and Nishikawa is deficient in its teaching of each and every element of Claim 28, and therefore cannot properly be applied to establish a prima facie case of obviousness against Claim 28.

Accordingly, Applicant submits that Claim 28 is directed to allowable subject matter, and respectfully requests notice of allowance thereof.

Regarding Claim 33

Claim 33 has been amended to recite limitations similar to those of amended Claim 1.

In view of the remarks set forth above regarding Claim 1, which Applicant submits are equally applicable to amended Claim 33, Applicant submits that the combination of Giger and Nishikawa is deficient in its teaching of each and every element of Claim 33, and therefore cannot properly be applied to establish a prima facie case of obviousness against Claim 33.

Accordingly, Applicant submits that Claim 33 is directed to allowable subject matter, and respectfully requests notice of allowance thereof.

Regarding Claims 37-41, 43, 44 and 46

Claims 37-41, 43, 44 and 46 depend either directly or indirectly from Claim 34, which has been amended as set forth above to now recite limitations similar to those of Claim 1.

In view of the remarks set forth above regarding Claims 1 and 34, Applicant submits that the combination of Giger and Nishikawa is deficient in its teaching of each and every element of Claim 34, and therefore cannot properly be applied to establish a prima facie case of obviousness against claims dependent from Claim 34.

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Accordingly, Applicant submits that Claims 37-41, 43, 44 and 46 are directed to allowable subject matter, and respectfully requests notice of allowance thereof.

Group III:

Regarding Claims 47-51

Claim 47 has been amended to recite limitations similar to those of amended Claim 1.

In view of the remarks set forth above regarding Claim 1, which Applicant submits are equally applicable to amended Claim 47, Applicant submits that the combination of Giger and Nishikawa is deficient in its teaching of each and every element of Claim 47, and therefore cannot properly be applied to establish a prima facie case of obviousness against Claim 47 or claims dependent from Claim 47.

Accordingly, Applicant submits that Claims 47-51 are directed to allowable subject matter, and respectfully requests notice of allowance thereof.

In view of the foregoing, Applicant submits that the References fail to teach or suggest each and every element of the claimed invention and are therefore wholly inadequate in their teaching of the claimed invention as a whole, fail to motivate one skilled in the art to do what the patent Applicant has done, fail to offer any reasonable expectation of success in combining the References to perform as the claimed invention performs, and discloses a substantially different invention from the claimed invention, and therefore cannot properly be used to establish a prima facie case of obviousness. Accordingly, Applicant respectfully requests reconsideration and withdrawal of all rejections under 35 U.S.C. §103(a), which Applicant considers to be traversed.

In light of the forgoing, Applicant respectfully submits that the Examiner's rejections under 35 U.S.C. §102(b) and 35 U.S.C. §103(a) have been traversed, and respectfully requests that the Examiner reconsider and withdraw these rejections.

Regarding New Claims 58-60

Applicant has added new Claims 58-60, which depend either directly or indirectly from Claim 1, and which are directed to disclosed but previously unclaimed subject matter. No new matter has been added as antecedent support may be found in the application as originally filed.

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such as at Paragraph [0076] (with respect to Claim 58), Paragraph [0054] and Claims 8 and 10-12 (with respect to Claim 59), and Paragraph [0054] (with respect to Claim 60).

For at least the reasons set forth above regarding the allowability of Claim 1, Applicant submits that Claims 58-60 are directed to allowable subject matter and respectfully requests notice of allowance thereof.

Regarding Claim 60 More Specifically

Claim 60 recites, inter alia,

"...wherein the feature selection algorithm sorts through candidate features, selects useful ones of the candidate features, and removes those that provide no information or redundant information."

In comparing the References with the claimed invention, Applicant finds Giger to disclose an artificial neural network (ANN) where "the connections between layers... are adjusted iteratively so that the difference between the output values and the desired results is minimized." (Col. 11, lines 39-46; and col. 12, lines 10-13). Here, Applicant finds the ANN of Giger to teach an iterative method to minimize a desired result, and to be absent a "sorting", "selecting" and "removing" procedure.

In further comparing the References with the claimed invention, Applicant finds Nishikawa to disclose an ANN to apply "a classification technique... to produce a classification result..." (Abstract, lines 12-14), where "The ANNs used in this invention proved themselves capable of classifying malignant and benign clustered microcalcifications as well as interstitial lung diseases." (Col. 20, lines 22-24). Here, Applicant finds the ANN of Nishikawa to teach classification, and to be absent a "sorting", "selecting" and "removing" procedure.

In view of the foregoing, Applicant submits that the References fail to disclose, teach, or suggest each and every element of the claimed invention, either arranged as claimed or arranged so as to perform as the claimed invention performs. Accordingly, and for at least this reason, Applicant submits that Claim 60 is directed to allowable subject matter and respectfully requests notice of allowance thereof.

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The Commissioner is hereby authorized to charge any additional fees that may be required for this amendment, or credit any overpayment, to Deposit Account No. 07-0845.

In the event that an extension of time is required, or may be required in addition to that requested in a petition for extension of time, the Commissioner is requested to grant a petition for that extension of time that is required to make this response timely and is hereby authorized to charge any fee for such an extension of time or credit any overpayment for an extension of time to the above-identified Deposit Account.

Respectfully submitted,

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